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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,243	05/07/2002	John W. Frost	6550-000038/CPB	2900

27572 7590 03/06/2003

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EXAMINER
STEADMAN, DAVID J

ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 03/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/937,243	FROST ET AL.	
	Examiner	Art Unit	
	David J. Steadman	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *58-116* is/are pending in the application.

4a) Of the above claim(s) *70-78,85,86 and 98-104* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *58-69,79-83,87-97 and 105-116* is/are rejected.

7)☒ Claim(s) *84* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Application Status

[1] Claims 58-116 are pending in the application.

[2] Applicants' election with traverse of Group I, claims 58-68, 79-84, and 87-97, in Paper No. 10, filed 01/06/03, is acknowledged.

Lack of Unity

[3] Applicants traverse the lack of unity by arguing that the inventions of Groups I-IV are related to a single general inventive concept and share at least one technical feature. Applicants argue that, according to the Administrative Instructions Under the PCT, Groups I and III should be rejoined and Groups II and IV should be rejoined. Applicants argue the bodies of art are interrelated and a serious burden would not result if a restriction were not made. Applicants argue the cited art disclosing methods for the production of 1,2,3,4-tetrahydroxybenzene do not involve the use of microbe.

Applicants' arguments are not found persuasive to rejoin Groups I, II, and IV. The method claims of Groups I and II utilize distinct products and therefore, share no special technical feature. Furthermore, applicants are reminded of the importance of claim order in determining the main invention for examination purposes. 37 CFR 1.475(d) states, "If multiple products, processes of manufacture, or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the main invention in the claims, see PCT Article 17(3)(a) and 1.476(c)" (see 37 CFR 1.499). Also, 37 CFR 1.475(b)(2) states, "a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the following combinations of categories:... ...a product and process of use of said product". Thus, according to 37 CFR 1.475, the claims of Groups I, II, and IV do not have unity of invention because the product of Group II, i.e., the microbe co-expressing myo-inositol-1-phosphate synthase and inositol dehydrogenase, is neither used nor made by the methods of Groups I and III.

Upon reconsideration of the lack of unity requirement, the claims of Group III will be rejoined and co-examined with the claims of Group I. It is noted that the invention of Group III, i.e., reductive conversion of 1,2,3,4-tetrahydroxybenzene to 1,2,3-trihydroxybenzene (pyrogallol), is well known in the art and therefore, may be obvious to one of ordinary skill in the art.

The lack of unity requirement is still deemed proper and is therefore made FINAL.

Claims 70-78, 85, 86, and 98-104 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a non-elected invention, there being no allowable generic or linking claim.

Claims 58-69, 79-84, 87-97, and 105-116 are being examined on the merits.

Specification/Informalities

[4] The specification is objected to because of the following informalities:

a. the address for the American Type Culture Collection (ATCC) listed at page 6, lines 21 and 22 is incorrect and should be replaced with "10801 University Boulevard, Manassas, VA 20110-2209"; and

b. the description of Figure 3 at page 3 of the specification provides no indication as to which of the symbols is meant to represent the myo-inositol produced and the dry cell weight. It is suggested that applicants identify what the solid circles, closed bars, and open bars represent in the description of Figure 3.

Claim Objections

[5] The following claims are objected to as being inconsistent and/or grammatically incorrect. In the interest of consistency and/or proper grammar, the following changes are suggested by the examiner:

a. replace "INO1" with "an INO1 gene" in claims 59 and 106;

b. replace "an *Saccharomyces cerevisiae INO1*" with "a *Saccharomyces cerevisiae INO1* gene" in claim 60;

c. replace "INO1" with "an INO1 gene" in claim 80;

d. replace "a *Saccharomyces cerevisiae INO1*" with "a *Saccharomyces cerevisiae INO1* gene" in claims 81 and 107; and

e. replace "INO1" with "the INO1 gene" in claims 61, 82, and 108;

Claim Rejections - 35 USC § 112, Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

[6] Claims 61, 82, 90, and 105-116 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claims 61, 82, 90, and 108 are confusing in that it is unclear as to how a first nucleic acid (an INO1 gene) can comprise a second nucleic acid (pAD1.88A) that is larger than the first nucleic acid. It is suggested that applicants clarify the meaning of the claim.

b. Claims 105 (claims 109 and 111-116 dependent therefrom), 106-108, and 110 are confusing in that it appears from the specification that the method requires a first microbe expressing myo-inositol-1-phosphate synthase and not myo-inositol-1-synthase. Furthermore, it appears that the INO1 gene encodes myo-inositol-1-phosphate synthase and not myo-inositol-1-synthase. It is suggested that applicants clarify the meaning of the claim by replacing the term "myo-inositol-1-synthase" in line 4 of claim 105 with "myo-inositol-1-phosphate synthase".

Claim Rejections - 35 USC § 112, First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

[11] Claims 58-69, 79-81, 83, 87-97, and 105-116 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 58 (claims 68 and 69 dependent therefrom), 59-68, 105 (claims 115 and 116 dependent therefrom), and 106-114 are drawn to methods of producing 1,2,3,4-tetrahydroxybenzene using a genus of first microbes comprising a recombinant DNA encoding myo-inositol-1-phosphate synthase and a genus of second microbes that express inositol dehydrogenase activity, and optionally wherein the DNA encoding myo-inositol-1-phosphate synthase is an INO1 gene (claims 59 and 106), a *S. cerevisiae* INO1 gene (claims 60 and 107), or plasmid pAD1.88A (claims 61 and 108), or optionally wherein the first microbe is *E. coli* (claims 62 and 109) or *E. coli* JWF1/pAD1.88A (claims 63 and 110), or optionally wherein the second microbe is *G. oxydans* (claims 64 and 111) or ATCC deposit 621 (claims 65 and 112), or optionally wherein the second microbe comprises a recombinant DNA encoding inositol dehydrogenase (claims 66 and 113) or a *B. subtilis* iolG gene (claims 67 and 114). Claims 79-84 are drawn to a genus of microbes comprising a recombinant DNA encoding myo-inositol-1-phosphate synthase (claim 79), and optionally wherein the DNA encoding myo-inositol-1-synthase is an INO1 gene (claim 80), a *S. cerevisiae* INO1 gene (claim 81), or optionally wherein the microbe is *E. coli* (claim 83). Claims 87 (claim 97 dependent therefrom) and 88-97 are drawn to a fermentation composition comprising a genus of first microbes comprising a recombinant DNA encoding myo-inositol-1-phosphate synthase and a genus of second microbes that expresses inositol dehydrogenase (claim 87), and optionally wherein the DNA encoding myo-inositol-1-phosphate synthase is an INO1 gene (claim 88), a *S. cerevisiae* INO1 gene (claim 89), or plasmid pAD1.88A (claim 90), or optionally wherein the first microbe is *E. coli* (claim 91) or *E. coli* JWF1/pAD1.88A (claim 92), or optionally wherein the second microbe is *G. oxydans* (claim 93) or ATCC deposit 621 (claim 94), or optionally wherein the second microbe comprises a recombinant DNA encoding inositol dehydrogenase (claim 95), or a *B. subtilis* iolG gene (claim 96). The claims are rejected

because the specification fails to adequately describe the entire genus of first or second microbes comprising or expressing the recited genes, recombinant DNAs, or inositol dehydrogenase polypeptides.

Regarding claims 58-69, 87-97, and 105-116, the specification teaches only a single representative species of first and second microbes as encompassed by the claims comprising or expressing the recited genes, recombinant DNAs, or inositol dehydrogenase polypeptides, i.e., *E. coli* JWF1/pAD1.88A as the first microbe and *G. oxydans* ATCC 621 as the second microbe. The specification fails to disclose any other representative species of fermentation mixtures comprising first or second microbes comprising or expressing the recited genes, recombinant DNAs, or inositol dehydrogenase polypeptides as encompassed by the claims. The single representative species of a first microbe (*E. coli* JWF1/pAD1.88A) or second microbe (*G. oxydans* ATCC 621) is insufficient to provide a description of all species of first and second microbes comprising encompassed by the genus of the claims.

Regarding claims 79-81, and 83, the specification teaches only a single representative species of microbes comprising a recombinant DNA encoding myo-inositol-1-phosphate synthase, i.e., *E. coli* JWF1/pAD1.88A. The specification fails to disclose any other representative species of microbes comprising a recombinant DNA encoding myo-inositol-1-phosphate synthase. This single representative species is insufficient to provide a description of all species of microbes encompassed by the genus of the claims.

Given the lack of additional representative species of microbes encompassed by the claims, applicants have failed to sufficiently describe the claimed invention, in such full, clear, concise and exact terms that a skilled artisan would not recognize that Applicants were in possession of the claimed invention.

[12] Claims 58-69, 79-81, 83, 87-97, and 105-116 are rejected under 35 U.S.C. 112, first paragraph. Regarding claims 58-69 and 105-116, the specification, while being enabling for a method for the production of 1,2,3,4-tetrahydroxybenzene using *E. coli* JWF1/pAD1.88A to convert a carbon source to myo-inositol and using *G. oxydans* ATCC 621 to convert myo-inositol to myo-2-inosose and converting the myo-2-inosose to 1,2,3,4-tetrahydroxybenzene by refluxing myo-2-inosose for 9 h in degassed,

aqueous 0.5 M H_2SO_4 acid, does not reasonably provide enablement for a method for the production of 1,2,3,4-tetrahydroxybenzene using any first microbe comprising a recombinant DNA encoding myo-inositol-1-phosphate synthase and any second microbe that expresses inositol dehydrogenase activity, and optionally wherein the DNA encoding myo-inositol-1-phosphate synthase is an INO1 gene, a *S. cerevisiae* INO1 gene, or plasmid pAD1.88A, or optionally wherein the first microbe is *E. coli* or *E. coli* JWF1/pAD1.88A, or optionally wherein the second microbe is *G. oxydans* or ATCC deposit 621, or optionally wherein the second microbe comprises a recombinant DNA encoding inositol dehydrogenase or a *B. subtilis* iolG gene, under any acid catalyzed dehydration conditions. Regarding claims 79-81 and 83, the specification, while being enabling for a method for a microbe comprising pAD1.88A or *E. coli* JWF1/pAD1.88A, does not reasonably provide enablement for all microbes comprising a recombinant DNA encoding myo-inositol-1-phosphate synthase and optionally wherein the DNA is an INO1 gene or an *S. cerevisiae* INO1 gene, or optionally wherein the microbe is an E. coli. Regarding claims 87-97, the specification, while being enabling for a fermentation mixture comprising *E. coli* JWF1/pAD1.88A and *G. oxydans* ATCC 621, does not reasonably provide enablement for any first microbe comprising a recombinant DNA encoding myo-inositol-1-phosphate synthase and any second microbe that expresses inositol dehydrogenase activity, and optionally wherein the DNA encoding myo-inositol-1-phosphate synthase is an INO1 gene, a *S. cerevisiae* INO1 gene, or optionally wherein the first microbe is *E. coli* or optionally wherein the second microbe is any *G. oxydans*, or optionally wherein the second microbe comprises a recombinant DNA encoding inositol dehydrogenase or a *B. subtilis* iolG gene.

Undue experimentation would be required for a skilled artisan to make the entire scope of the claimed methods. Factors to be considered in determining whether undue experimentation is required, are summarized in *In re* Wands (858 F.2d 731, 8 USPQ 2nd 1400 (Fed. Cir. 1988)) as follows: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claim(s). The Factors most relevant to this rejection are addressed below:

- The breadth of the claims – the claims are so broad as to encompass the entire scope of methods and microbes as stated above. The scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of microbes and conditions for acid catalyzed dehydration broadly encompassed by the claims. In this case, the disclosure is enabling for a method for the production of 1,2,3,4-tetrahydroxybenzene using *E. coli* JWF1/pAD1.88A to convert a carbon source to myo-inositol and using *G. oxydans* ATCC 621 to convert myo-inositol to myo-2-inosose and converting the myo-2-inosose to 1,2,3,4-tetrahydroxybenzene by refluxing myo-2-inosose for 9 h in degassed, aqueous 0.5 M H_2SO_4 acid; a microbe comprising pAD1.88A or *E. coli* JWF1/pAD1.88A; and a fermentation mixture comprising *E. coli* JWF1/pAD1.88A and *G. oxydans* ATCC 621.
- The amount of guidance and working examples – the specification provides guidance in the form of a single working example for producing 1,2,3,4-tetrahydroxybenzene using *E. coli* JWF1/pAD1.88A and *G. oxydans* ATCC 621 and the conditions of refluxing myo-2-inosose for 9 h in degassed, aqueous 0.5 M H_2SO_4 acid (see pages 9-15 of the instant specification). The specification fails to provide additional guidance regarding other microorganisms or dehydration conditions that may be successfully employed in the claimed methods. The specification teaches that a step required for the conversion of myo-inositol-1-phosphate to myo-inositol is "fortuitously catalyzed in *E. coli* JWF1/pAD1.88A by unidentified cytosolic or periplasmic phosphatase activity", thus suggesting that *E. coli* JWF1/pAD1.88A is required to practice the claimed invention as there is no guidance provided for other microbes that may have such unidentified phosphatase activity. Furthermore, the specification discloses that the conditions of converting the myo-2-inosose to 1,2,3,4-tetrahydroxybenzene are critical by disclosing "inososes have been thought to be stable under acidic conditions and reactive under basic conditions with reported aromatizations resulting from successive β-eliminations being dominated by formation of 1,2,3,5-tetrahydroxybenzene" and that "However, it was observed that myo-2-inosose was reactive under acidic conditions with no apparent formation of 1,2,3,5-tetrahydroxybenzene" (see particularly page 10, lines 6-14 of the instant specification). Also, the prior art teaches that the use of common acid catalysts gives rise to an

aromatization of acyl derivatives of myo-2-inosose with formation of derivatives of 1,2,3,5-tetrahydroxybenzene (Posternak in *The Cyclitols* page 164, Holden Day, San Francisco, CA 1965). Thus, one of skill in the art would recognize the specification fails to provide guidance that would enable a skilled artisan to produce 1,2,3,4-tetrahydroxybenzene using the broad scope of recited microbes and conditions for acid catalyzed dehydration encompassed by the claims. Furthermore, regarding the first and second microbes, the specification fails to provide sufficient guidance for a skilled artisan to make the entire scope of claimed microbes. The specification has provided only two working examples of microbes that can be used to practice the claimed invention, i.e., *E. coli* JWF1/pAD1.88A and *G. oxydans* ATCC 621. The specification provides no further guidance for isolating other microbes having the desired properties for use in the production of the desired intermediates.

- The unpredictability of the art – regarding the scope of microbes, one of skill in the art would recognize the high degree of unpredictability for using any microbe as encompassed by the claims for generating the desired product as different microbes possess distinct metabolic pathways. Such pathways may not be optimized for the production of myo-inositol or myo-inosose and may instead produce some other product, even those comprising the requisite enzymes of myo-inositol-1-synthase of the first microbe and inositol dehydrogenase of the second microbe. Thus, one of skill in the art would recognize that all microbes as recited by the claims would not be useful for production of the desired product, particularly in view of applicants' disclosure that a step required for the conversion of myo-inositol-1-phosphate to myo-inositol is "fortuitously catalyzed in *E. coli* JWF1/pAD1.88A by unidentified cytosolic or periplasmic phosphatase activity" as stated above. Regarding the scope of acid catalyzed dehydration conditions, one of skill in the art would recognize, particularly based on the teachings of the specification and the prior art, that the conversion of myo-2-inosose to 1,2,3,4-tetrahydroxybenzene under any conditions of acid catalyzed dehydration is highly unpredictable. The specification discloses that the conditions of converting the myo-2-inosose to 1,2,3,4-tetrahydroxybenzene are critical by disclosing "inososes have been thought to be stable under acidic conditions and reactive under basic conditions with reported aromatizations resulting from successive β-eliminations being dominated by formation of

1,2,3,5-tetrahydroxybenzene" and that "However, it was observed that myo-2-inosose was reactive under acidic conditions with no apparent formation of 1,2,3,5-tetrahydroxybenzene" (see particularly page 10, lines 6-14 of the instant specification). Furthermore, the prior art teaches that the use of common acid catalysts gives rise to an aromatization of acyl derivatives of myo-2-inosose with formation of derivatives of 1,2,3,5-tetrahydroxybenzene (Posternak in *The Cyclitols* page 164, Holden Day, San Francisco, CA 1965).

- The quantity of experimentation necessary – based on the teachings of the specification in combination with the prior art, a skilled artisan would recognize the experimentation required to make the entire scope of claimed methods would be far from routine. While the use of microbes, particularly recombinant microbes for use in biosynthesis of a desired product are known in the art, it is not routine in the art to screen all microbes, particularly those having the required unidentified phosphatase activity, as encompassed by the claims to identify those microbes with a metabolic pathway amenable to the production of the desired intermediate product, myo-inositol and myo-2-inosose as encompassed by the instant claims. Furthermore, it is not routine to screen for all conditions for acid catalyzed dehydration of myo-2-inosose that are capable of converting myo-2-inosose into 1,2,3,4-tetrahydroxybenzene, particularly in view of the teachings of the specification and prior art that teach that acid catalysts convert myo-2-inosose to 1,2,3,5-tetrahydroxybenzene.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims. The scope of the claims must bear a reasonable correlation with the scope of enablement (*In re* Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See *In re* Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

[13] Claims 61, 63, 65, 82, 84, 90, 92, 94, 108, 110, and 112 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to

enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The invention appears to employ a novel plasmid or microorganism. Since the microorganism is essential to the claimed invention, it must be obtainable by a repeatable method set forth in the specification or otherwise be readily available to the public. The method of generating the recited plasmid or microorganism is not fully disclosed, nor has the plasmid or microorganism been shown to be publicly known and freely available. The enablement requirements of 35 U.S.C. § 112 may be satisfied by a deposit of the plasmid or microorganism. The specification does not disclose a repeatable process to obtain the microorganism and it is not apparent if the microorganism is readily available to the public. It is noted that the specification states that the plasmid and microorganism have been deposited in accordance with the Budapest Treaty (see page 6, lines 22 and 23). If the deposit was made under the terms of the Budapest Treaty, then an affidavit or declaration by applicants, or a statement by an attorney of record over his or her signature and registration number, stating that the specific strain has been deposited under the Budapest Treaty and that the strain will be irrevocably and without restriction or condition released to the public upon the issuance of the patent, would satisfy the deposit requirement made herein.

Conclusion

[14] Claims 58-69, 79-83, 87-97, and 105-116 are rejected.

[15] Claims 58-69, 79-83, 87-97, and 105-116 would be allowable if rewritten to overcome the objection(s) and/or rejection(s) under 35 U.S.C. 112, first and second paragraphs, set forth in this Office action.

[16] Claim 84 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

[17] No claim is in condition for allowance.

[18] The examiner requests that applicants provide a copy of all pending claims in the response to this Office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Steadman, whose telephone number is (703) 308-3934. The Examiner can normally be reached Monday-Thursday from 6:30 am to 5:00 pm. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Ponnathapura Achutamurthy, can be reached at (703) 308-3804. The FAX number for official papers filed to Group 1600 is (703) 308-4242. Draft or informal FAX communications should be directed to (703) 746-5078. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Art Unit receptionist whose telephone number is (703) 308-0196.

David J. Steadman, Ph.D.
Patent Examiner
Art Unit 1652

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PRIMARY EXAMINER
GROUP ~~1800~~ 1600